

SEQUENCE LISTING

<110> Saba, Julie D.
Fyrst, Henrik

<120> SPHINGOSINE-1-PHOSPHATE LYASE POLYPEPTIDES,
POLYNUCLEOTIDES AND MODULATING AGENTS AND
METHODS OF USE THEREFOR

<130> 200116.402C2

<140> US

<141> 2002-01-17

<160> 21

<170> FastSEQ for Windows Version 4.0

<210> 1

<211> 1770

<212> DNA

<213> *S. cerevisiae*

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att	cta	acc	atc	aac	gaa	tta	aaa	ata	gcc	ata	cat	ggt	tac	ctc	aga	144
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Pro	Val	Arg	Leu	Ala	Val	Arg	Thr	Tyr	Glu	His	Ser	Ser	Arg	Arg	Leu	
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Phe Arg Trp Leu Leu Asp Ser Pro Phe Leu Arg Gly Thr Val Glu Lys	
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gaa gtc aca aag gtc aaa caa tcg atc gaa gac gaa cta att aga tcg	384
Glu Val Thr Lys Val Lys Gln Ser Ile Glu Asp Glu Leu Ile Arg Ser	
115 120 125	
gac tct cag tta atg aat ttc cca cag ttg cca tcc aat ggg ata cct	432
Asp Ser Gln Leu Met Asn Phe Pro Gln Leu Pro Ser Asn Gly Ile Pro	
130 135 140	
cag gat gat gtt att gaa gag cta aat aaa ttg aac gac ttg ata cca	480
Gln Asp Asp Val Ile Glu Glu Leu Asn Lys Leu Asn Asp Leu Ile Pro	
145 150 155 160	
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His Thr Gln Trp Lys Glu Gly Lys Val Ser Gly Ala Val Tyr His Gly	
165 170 175	
ggt gat gat ttg atc cac tta caa aca atc gca tac gaa aaa tat tgc	576
Gly Asp Asp Leu Ile His Leu Gln Thr Ile Ala Tyr Glu Lys Tyr Cys	
180 185 190	
gtt gcc aat caa tta cat ccc gat gtc ttt oct gcc gta cgt aaa atg	624
Val Ala Asn Gln Leu His Pro Asp Val Phe Pro Ala Val Arg Lys Met	
195 200 205	
gaa tcc gaa gtg gtt tct atg gtt tta aga atg ttt aat gcc cct tct	672
Glu Ser Glu Val Val Ser Met Val Leu Arg Met Phe Asn Ala Pro Ser	
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Asp Thr Gly Cys Gly Thr Thr Thr Ser Gly Gly Thr Glu Ser Leu Leu	
225 230 235 240	
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Thr Glu Pro Glu Ile Ile Ala Pro Val Thr Ala His Ala Gly Phe Asp	
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Lys Ala Ala Tyr Tyr Phe Gly Met Lys Leu Arg His Val Glu Leu Asp	
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cca acg aca tat caa gtg gac ctg gga aaa gtg aaa aaa ttc atc aat	912
Pro Thr Thr Tyr Gln Val Asp Leu Gly Lys Val Lys Lys Phe Ile Asn	
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Leu Pro Leu His Val Asp Ser Cys Leu Gly Ser Phe Ile Val Ser Phe				340				345						350			
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Pro Gly Val Thr Ser Ile Ser Cys Asp Thr His Lys Tyr Gly Phe Ala		370				375					380						
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Pro Lys Gly Ser Ser Val Ile Met Tyr Arg Asn Ser Asp Leu Arg Met		385			390				395							400	
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cct aca tta gca ggg tcc agg cct ggt gct att gtc gta ggt tgt tgg																	1296
Pro Thr Leu Ala Gly Ser Arg Pro Gly Ala Ile Val Val Gly Cys Trp			420				425						430				
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Ala Thr Met Val Asn Met Gly Glu Asn Gly Tyr Ile Glu Ser Cys Gln		435				440					445						
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Glu Ile Val Gly Ala Ala Met Lys Phe Lys Lys Tyr Ile Gln Glu Asn		450			455					460							
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Ile Pro Asp Leu Asn Ile Met Gly Asn Pro Arg Tyr Ser Val Ile Ser					470				475							480	
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Phe Ser Ser Lys Thr Leu Asn Ile His Glu Leu Ser Asp Arg Leu Ser				485			490							495			
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Lys Lys Gly Trp His Phe Asn Ala Leu Gln Lys Pro Val Ala Leu His			500				505					510					
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Met Ala Phe Thr Arg Leu Ser Ala His Val Val Asp Glu Ile Cys Asp		515				520					525						

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Pro Ser Pro Asp Gly Thr Ser Ala Leu Tyr Gly Val Ala Gly Ser Val
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aaa act gct ggc gtt gca gac aaa ttg att gtg gga ttc cta gac gca 1728
Lys Thr Ala Gly Val Ala Asp Lys Leu Ile Val Gly Phe Leu Asp Ala
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Asn Thr Pro Trp Tyr Asn Met Leu Lys Asp Tyr Leu Phe Val Ile Phe
50 55 60
Cys Tyr Lys Leu Ile Ser Asn Phe Phe Tyr Leu Leu Lys Val Tyr Gly
65 70 75 80
Pro Val Arg Leu Ala Val Arg Thr Tyr Glu His Ser Ser Arg Arg Leu
85 90 95
Phe Arg Trp Leu Leu Asp Ser Pro Phe Leu Arg Gly Thr Val Glu Lys
100 105 110
Glu Val Thr Lys Val Lys Gln Ser Ile Glu Asp Glu Leu Ile Arg Ser
115 120 125
Asp Ser Gln Leu Met Asn Phe Pro Gln Leu Pro Ser Asn Gly Ile Pro
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Gln Asp Asp Val Ile Glu Glu Leu Asn Lys Leu Asn Asp Leu Ile Pro
145 150 155 160
His Thr Gln Trp Lys Glu Gly Lys Val Ser Gly Ala Val Tyr His Gly
165 170 175
Gly Asp Asp Leu Ile His Leu Gln Thr Ile Ala Tyr Glu Lys Tyr Cys
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Val Ala Asn Gln Leu His Pro Asp Val Phe Pro Ala Val Arg Lys Met
195 200 205
Glu Ser Glu Val Val Ser Met Val Leu Arg Met Phe Asn Ala Pro Ser
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Asp Thr Gly Cys Gly Thr Thr Thr Ser Gly Gly Thr Glu Ser Leu Leu

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225 230 235 240
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 260 265 270
 Lys Ala Ala Tyr Tyr Phe Gly Met Lys Leu Arg His Val Glu Leu Asp
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 290 295 300
 Lys Asn Thr Ile Leu Leu Val Gly Ser Ala Pro Asn Phe Pro His Gly
 305 310 315 320
 Ile Ala Asp Asp Ile Glu Gly Leu Gly Lys Ile Ala Gln Lys Tyr Lys
 325 330 335
 Leu Pro Leu His Val Asp Ser Cys Leu Gly Ser Phe Ile Val Ser Phe
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 Met Glu Lys Ala Gly Tyr Lys Asn Leu Pro Leu Leu Asp Phe Arg Val
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 Pro Gly Val Thr Ser Ile Ser Cys Asp Thr His Lys Tyr Gly Phe Ala
 370 375 380
 Pro Lys Gly Ser Ser Val Ile Met Tyr Arg Asn Ser Asp Leu Arg Met
 385 390 395 400
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 405 410 415
 Pro Thr Leu Ala Gly Ser Arg Pro Gly Ala Ile Val Val Gly Cys Trp
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 Ala Thr Met Val Asn Met Gly Glu Asn Gly Tyr Ile Glu Ser Cys Gln
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 450 455 460
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 485 490 495
 Lys Lys Gly Trp His Phe Asn Ala Leu Gln Lys Pro Val Ala Leu His
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 Met Ala Phe Thr Arg Leu Ser Ala His Val Val Asp Glu Ile Cys Asp
 515 520 525
 Ile Leu Arg Thr Thr Val Gln Glu Leu Lys Ser Glu Ser Asn Ser Lys
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Phe Glu Leu Arg Lys Phe Asn Pro Ile Val Leu Val Ser Ser Thr Ile	
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gtt gca aca tac gta ctc acc aat ctg aga cat atg cat tta gat gaa	144
Val Ala Thr Tyr Val Leu Thr Asn Leu Arg His Met His Leu Asp Glu	
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atg ggc atc cgg aaa cgt ttg agc act tgg ttt ttc acc act gta aag	192
Met Gly Ile Arg Lys Arg Leu Ser Thr Trp Phe Phe Thr Thr Val Lys	
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cgt gtg cct ttc atc agg aaa atg att gac aaa caa cta aac gaa gta	240
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Lys Asp Glu Leu Glu Lys Ser Leu Arg Ile Val Asp Arg Ser Thr Glu	
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Tyr Phe Thr Thr Ile Pro Ser His Ser Val Gly Arg Thr Glu Val Leu	
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cgc ctt gct gcc atc tat gat gat ttg gaa gga cca gct ttt ttg gaa	384
Arg Leu Ala Ala Ile Tyr Asp Asp Leu Glu Gly Pro Ala Phe Leu Glu	
115 120 125	
gga aga gta tct gga gca gtc ttc aat aga gaa gac gac aag gac gaa	432
Gly Arg Val Ser Gly Ala Val Phe Asn Arg Glu Asp Asp Lys Asp Glu	
130 135 140	
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Leu Trp Pro Lys Leu Phe Pro Gly Val Arg Ile Met Glu Ala Glu Val	
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Val Arg Met Cys Cys Asn Met Met Asn Gly Asp Ser Glu Thr Cys Gly	
180 185 190	
act atg tca act ggt gga tcc att tca att ctt ttg gcg tgc ctg gct	624
Thr Met Ser Thr Gly Gly Ser Ile Ser Ile Leu Leu Ala Cys Leu Ala	
195 200 205	

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His Arg Asn Arg Leu Leu Lys Arg Gly Glu Lys Tyr Thr Glu Met Ile	
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cgt atc aaa gtt cgc aag att cca gtt gat cct gtt act ttc aaa gta	768
Arg Ile Lys Val Arg Lys Ile Pro Val Asp Pro Val Thr Phe Lys Val	
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Asp Leu Val Lys Met Lys Ala Ala Ile Asn Lys Arg Thr Cys Met Leu	
260 265 270	
gtt gga tct gct cca aac ttt cca ttt gga act gtt gat gac att gaa	864
Val Gly Ser Ala Pro Asn Phe Pro Phe Gly Thr Val Asp Asp Ile Glu	
275 280 285	
gct att gga cag cta gga ctt gaa tat gac atc cca gtt cat gtt gat	912
Ala Ile Gly Gln Leu Gly Leu Glu Tyr Asp Ile Pro Val His Val Asp	
290 295 300	
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Ala Cys Leu Gly Gly Phe Leu Leu Pro Phe Leu Glu Glu Asp Glu Ile	
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cgc tat gac ttc cgt gtt cct ggt gta tct tcg att tct gca gat agt	1008
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325 330 335	
cac aaa tac gga ctc gct cca aag ggg tca tca gtt gtt ctt tat cgc	1056
His Lys Tyr Gly Leu Ala Pro Lys Gly Ser Ser Val Val Leu Tyr Arg	
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 Phe His Asn Phe Met Lys Glu Lys His Trp Gln Leu Asn Gly Leu Gln
 450 455 460
 ttc cca gct gga gtt cat atc atg gtc act atg aat cat act cat cct 1440
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 465 470 475 480
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 485 490 495
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 65 70 75 80
 Lys Asp Glu Leu Glu Lys Ser Leu Arg Ile Val Asp Arg Ser Thr Glu
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 Cys Thr Leu Leu Ile Val Trp Val Tyr Glu Leu Ile Phe Gln Pro Glu
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 Met Pro Phe Ile Gly Arg Lys Ile Glu Gln Gln Val Ser Lys Ala Lys
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aag gat ctt gtc aag aac atg cca ttc cta aag gtg gac aag gat tat 336
 Lys Asp Leu Val Lys Asn Met Pro Phe Leu Lys Val Asp Lys Asp Tyr
 100 105 110

gtg aaa act ctg cct gct cag ggt atg ggc aca gct gag gtt ctg gag 384
 Val Lys Thr Leu Pro Ala Gln Gly Met Gly Thr Ala Glu Val Leu Glu
 115 120 125

aga ctc aag gag tac agc tcc atg gat ggt tcc tgg caa gaa ggg aaa 432
 Arg Leu Lys Glu Tyr Ser Ser Met Asp Gly Ser Trp Gln Glu Gly Lys
 130 135 140

gcc tca gga gct gtg tac aat ggg gaa ccg aag ctc acg gag ctg ctg 480
 Ala Ser Gly Ala Val Tyr Asn Gly Glu Pro Lys Leu Thr Glu Leu Leu
 145 150 155 160

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 Glu Leu Glu Asn Ile Lys Asn Ile Phe Ile Phe Gly Asp Pro Gln Leu
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 Ser Val Ile Ala Leu Gly Ser Asn Asp Phe Asp Ile Tyr Arg Leu Ser
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 Arg Ser Ile His Phe Cys Ile Thr Leu Val His Thr Arg Lys Arg Val
 485 490 495
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 Ala Ile Gln Phe Leu Lys Asp Ile Arg Glu Ser Val Thr Gln Ile Met
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 aag aat cct aaa gct aag acc aca gga atg ggt gcc atc tat ggc atg 1584
 Lys Asn Pro Lys Ala Lys Thr Thr Gly Met Gly Ala Ile Tyr Gly Met
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 Cys Thr Leu Leu Ile Val Trp Val Tyr Glu Leu Ile Phe Gln Pro Glu
 50 55 60
 Ser Leu Trp Ser Arg Phe Lys Lys Lys Leu Phe Lys Leu Ile Arg Lys
 65 70 75 80
 Met Pro Phe Ile Gly Arg Lys Ile Glu Gln Gln Val Ser Lys Ala Lys
 85 90 95
 Lys Asp Leu Val Lys Asn Met Pro Phe Leu Lys Val Asp Lys Asp Tyr
 100 105 110
 Val Lys Thr Leu Pro Ala Gln Gly Met Gly Thr Ala Glu Val Leu Glu
 115 120 125
 Arg Leu Lys Glu Tyr Ser Ser Met Asp Gly Ser Trp Gln Glu Gly Lys
 130 135 140
 Ala Ser Gly Ala Val Tyr Asn Gly Glu Pro Lys Leu Thr Glu Leu Leu
 145 150 155 160
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 165 170 175
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 195 200 205
 Gly Gly Thr Glu Ser Ile Leu Met Ala Cys Lys Ala Tyr Arg Asp Leu
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 225 230 235 240
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 245 250 255
 Val Arg Val Ala Leu Lys Lys Asn Met Glu Val Asp Val Gln Ala Met
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 Lys Arg Ala Ile Ser Arg Asn Thr Ala Met Leu Val Cys Ser Thr Pro
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 Gln Phe Pro His Gly Val Met Asp Pro Val Pro Glu Val Ala Lys Leu
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 Thr Val Arg Tyr Lys Ile Pro Leu His Val Asp Ala Cys Leu Gly Gly
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 Glu Lys Tyr Arg Thr Tyr Gln Phe Phe Val Gly Ala Asp Trp Gln Gly
 370 375 380
 Gly Val Tyr Ala Ser Pro Ser Ile Ala Gly Ser Arg Pro Gly Gly Ile
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 Val Glu Ala Thr Lys Gln Ile Ile Lys Thr Ala Arg Phe Leu Lys Ser
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Glu Leu Glu Asn Ile Lys Asn Ile Phe Ile Phe Gly Asp Pro Gln Leu
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 Ser Val Ile Ala Leu Gly Ser Asn Asp Phe Asp Ile Tyr Arg Leu Ser
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 485 490 495
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<213> Homo sapiens

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Glu Ile Leu Glu Val Tyr Ser Thr Lys Ala Lys Asn Tyr Val Asn Gly	
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His Cys Thr Lys Tyr Glu Pro Trp Gln Leu Ile Ala Trp Ser Val Val	
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Trp Thr Leu Leu Ile Val Trp Gly Tyr Glu Phe Val Phe Gln Pro Glu	
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 agt tta tgg tca agg ttt aaa aag aaa tgt ttt aag ctc acc agg aag	240
Ser Leu Trp Ser Arg Phe Lys Lys Lys Cys Phe Lys Leu Thr Arg Lys	
65 70 75 80	
 atg ccc att att ggt cgt aag att caa gac aag ttg aac aag acc aag	288
Met Pro Ile Ile Gly Arg Lys Ile Gln Asp Lys Leu Asn Lys Thr Lys	
85 90 95	

gat gat att agc aag aac atg tca ttc ctg aaa gtg gac aaa gag tat 336
Asp Asp Ile Ser Lys Asn Met Ser Phe Leu Lys Val Asp Lys Glu Tyr
100 105 110

gtg aaa gct tta ccc tcc cag ggt ctg agc tca tct gct gtt ttg gag 384
Val Lys Ala Leu Pro Ser Gln Gly Leu Ser Ser Ser Ala Val Leu Glu
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Lys Leu Lys Glu Tyr Ser Ser Met Asp Ala Phe Trp Gln Glu Gly Arg
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Ile Phe Pro Gly Leu Arg Lys Ile Glu Ala Glu Ile Val Arg Ile Ala
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Cys Ser Leu Phe Asn Gly Gly Pro Asp Ser Cys Gly Cys Val Thr Ser
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Gly Gly Thr Glu Ser Ile Leu Met Ala Cys Lys Ala Cys Arg Asp Leu
210 215 220

gcc ttt gag aag ggg atc aaa act cca gaa att gtg gct ccc caa agt 720
Ala Phe Glu Lys Gly Ile Lys Thr Pro Glu Ile Val Ala Pro Gln Ser
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245 250 255

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Val Arg Val Pro Leu Thr Lys Met Met Glu Val Asp Val Arg Ala Met
260 265 270

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275 280 285

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Gln Phe Pro His Gly Val Ile Asp Pro Val Pro Glu Val Ala Lys Leu
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Ala Val Lys Tyr Lys Ile Pro Leu His Val Asp Ala Cys Leu Gly Gly

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Lys Tyr Gly Tyr Ala Pro Lys Gly Ser Ser Leu Val Leu Tyr Ser Asp	355	360	365	
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Lys Lys Tyr Arg Asn Tyr Gln Phe Phe Val Asp Thr Asp Trp Gln Gly	370	375	380	
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Gly Ile Tyr Ala Ser Pro Thr Ile Ala Gly Ser Arg Pro Gly Gly Ile	385	390	395	400
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Ser Ala Ala Cys Trp Ala Ala Leu Met His Phe Gly Glu Asn Gly Tyr	405	410	415	
gtt gaa gct acc aaa cag atc atc aaa act gct cgc ttc ctc aag tca				1296
Val Glu Ala Thr Lys Gln Ile Ile Lys Thr Ala Arg Phe Leu Lys Ser	420	425	430	
gaa ctg gaa aat atc aaa ggc atc ttt gtt ttt ggg aat ccc caa ttg				1344
Glu Leu Glu Asn Ile Lys Gly Ile Phe Val Phe Gly Asn Pro Gln Leu	435	440	445	
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Ser Leu Ile Ala Leu Gly Ser Arg Asp Phe Asp Ile Tyr Arg Leu Ser	450	455	460	
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Asn Leu Met Thr Ala Lys Gly Trp Asn Leu Asn Gln Leu Gln Phe Pro	465	470	475	480
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Pro Ser Ile His Phe Cys Ile Thr Leu Leu His Ala Arg Lys Arg Val	485	490	495	
gct ata caa ttc cta aag gac att cga gaa tct gtc act caa atc atg				1536
Ala Ile Gln Phe Leu Lys Asp Ile Arg Glu Ser Val Thr Gln Ile Met	500	505	510	
aag aat cct aaa gcg aag acc aca gga atg ggt gcc atc tat gcc atg				1584
Lys Asn Pro Lys Ala Lys Thr Thr Gly Met Gly Ala Ile Tyr Ala Met	515	520	525	

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ttc ttg gac agc ttg tac agc acc gac act gtc acc cag ggc agc cag 1680
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 35 40 45
 Trp Thr Leu Leu Ile Val Trp Gly Tyr Glu Phe Val Phe Gln Pro Glu
 50 55 60
 Ser Leu Trp Ser Arg Phe Lys Lys Lys Cys Phe Lys Leu Thr Arg Lys
 65 70 75 80
 Met Pro Ile Ile Gly Arg Lys Ile Gln Asp Lys Leu Asn Lys Thr Lys
 85 90 95
 Asp Asp Ile Ser Lys Asn Met Ser Phe Leu Lys Val Asp Lys Glu Tyr
 100 105 110
 Val Lys Ala Leu Pro Ser Gln Gly Leu Ser Ser Ser Ala Val Leu Glu
 115 120 125
 Lys Leu Lys Glu Tyr Ser Ser Met Asp Ala Phe Trp Gln Glu Gly Arg
 130 135 140
 Ala Ser Gly Thr Val Tyr Ser Gly Glu Glu Lys Leu Thr Glu Leu Leu
 145 150 155 160
 Val Lys Ala Tyr Gly Asp Phe Ala Trp Ser Asn Pro Leu His Pro Asp
 165 170 175
 Ile Phe Pro Gly Leu Arg Lys Ile Glu Ala Glu Ile Val Arg Ile Ala
 180 185 190
 Cys Ser Leu Phe Asn Gly Gly Pro Asp Ser Cys Gly Cys Val Thr Ser
 195 200 205
 Gly Gly Thr Glu Ser Ile Leu Met Ala Cys Lys Ala Cys Arg Asp Leu
 210 215 220
 Ala Phe Glu Lys Gly Ile Lys Thr Pro Glu Ile Val Ala Pro Gln Ser
 225 230 235 240
 Ala His Ala Ala Phe Asn Lys Ala Ala Ser Tyr Phe Gly Met Lys Ile
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 Val Arg Val Pro Leu Thr Lys Met Met Glu Val Asp Val Arg Ala Met
 260 265 270
 Arg Arg Ala Ile Ser Arg Asn Thr Ala Met Leu Val Cys Ser Thr Pro

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 Phe Asp Phe Arg Val Lys Gly Val Thr Ser Ile Ser Ala Asp Thr His
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 Lys Tyr Gly Tyr Ala Pro Lys Gly Ser Ser Leu Val Leu Tyr Ser Asp
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 Lys Lys Tyr Arg Asn Tyr Gln Phe Phe Val Asp Thr Asp Trp Gln Gly
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 Ala Ile Gln Phe Leu Lys Asp Ile Arg Glu Ser Val Thr Gln Ile Met
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 Lys Asn Pro Lys Ala Lys Thr Thr Gly Met Gly Ala Ile Tyr Ala Met
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Glu Ile Leu Glu Val Tyr Ser Thr Lys Ala Lys Asn Tyr Val Asn Gly
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 His Cys Thr Lys Tyr Glu Pro Trp Gln Leu Ile Ala Trp Ser Val Val
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 Trp Thr Leu Leu Ile Val Trp Gly Tyr Glu Phe Val Phe Gln Pro Glu
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 65 70 75 80
 atg ccc att att ggt cgt aag att caa gac aag ttg aac aag acc aag 288
 Met Pro Ile Ile Gly Arg Lys Ile Gln Asp Lys Leu Asn Lys Thr Lys
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 Asp Asp Ile Ser Lys Asn Met Ser Phe Leu Lys Val Asp Lys Glu Tyr
 100 105 110
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 Val Lys Ala Leu Pro Ser Gln Gly Leu Ser Ser Ser Ala Val Leu Glu
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 130 135 140
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 gtg aag gct tat gga gat ttt gca tgg agt aac ccc ctg cat cca gat 528
 Val Lys Ala Tyr Gly Asp Phe Ala Trp Ser Asn Pro Leu His Pro Asp
 165 170 175
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 Ile Phe Pro Gly Leu Arg Lys Ile Glu Ala Glu Ile Val Arg Ile Ala
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 225 230 235 240

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 245 250 255

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 Val Arg Val Pro Leu Thr Lys Met Met Glu Val Asp Val Arg Ala Met
 260 265 270

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 275 280 285

cag ttt cct cat ggt gta ata gat cct gtc cct gaa gtg gcc aag ctg 912
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 290 295 300

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 Ala Val Lys Tyr Lys Ile Pro Leu His Val Asp Ala Cys Leu Gly Gly
 305 310 315 320

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 340 345 350

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 385 390 395 400

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 35 40 45
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 Val Lys Ala Tyr Gly Asp Phe Ala Trp Ser Asn Pro Leu His Pro Asp
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 Cys Ser Leu Phe Asn Gly Gly Pro Asp Ser Cys Gly Cys Val Thr Ser
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 Arg Ala Gly Gly Ile Ile Ala Ala Cys Trp Ala Thr Met Met Ser Phe
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 Arg Tyr Ile Glu Arg Gly Val Arg Asp Ile Asp Gly Ile Phe Ile Phe
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 Gly Lys Pro Ala Thr Ser Val Ile Ala Leu Gly Ser Asn Val Phe Asp
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 Thr Gln Pro Gly Val Ala Asp Lys Phe Ile Ala Asp Val Arg Ser Cys
 485 490 495
 Thr Ala Glu Ile Met Lys Asp Pro Gly Gln Pro Val Val Gly Lys Met
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 Glu Ile Leu Glu Val Tyr Ser Thr Lys Ala Lys Asn Tyr Val Asn Gly
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 His Cys Thr Lys Tyr Glu Pro Trp Gln Leu Ile Ala Trp Ser Val Val
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Met	Pro	Ile	Ile	Gly	Arg	Lys	Ile	Gln	Asp	Lys	Leu	Asn	Lys	Thr	Lys		
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Val	Lys	Ala	Leu	Pro	Ser	Gln	Gly	Leu	Ser	Ser	Ser	Ala	Val	Leu	Glu		
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Lys	Leu	Lys	Glu	Tyr	Ser	Ser	Met	Asp	Ala	Phe	Trp	Gln	Glu	Gly	Arg		
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Val	Arg	Val	Pro	Leu	Thr	Lys	Met	Met	Glu	Val	Asp	Val	Arg	Ala	Met		
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cag ttt cct cat ggt gta ata gat cct gtc cct gaa gtg gcc aag ctg 912
 Gln Phe Pro His Gly Val Ile Asp Pro Val Pro Glu Val Ala Lys Leu
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gct gtc aaa tac aaa ata ccc ctt cat gtc gac gct tgt ctg gga ggc 960
 Ala Val Lys Tyr Lys Ile Pro Leu His Val Asp Ala Cys Leu Gly Gly
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 Gly Ile Tyr Ala Ser Pro Thr Ile Ala Gly Ser Arg Pro Gly Gly Ile
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Pro Ser Ile His Phe Cys Ile Thr Leu Leu His Ala Arg Lys Arg Val
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 <213> Homo sapiens

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Phe	Leu	Ile	Val	Phe	Met	Glu	Lys	Ala	Gly	Tyr	Pro	Leu	Glu	His	Pro
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Val	Glu	Ala	Thr	Lys	Gln	Ile	Ile	Lys	Thr	Ala	Arg	Phe	Leu	Lys	Ser
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Pro	Ser	Ile	His	Phe	Cys	Ile	Thr	Leu	Leu	His	Ala	Arg	Lys	Arg	Val
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Phe	Leu	Asp	Ser	Leu	Tyr	Ser	Thr	Asp	Thr	Val	Thr	Gln	Gly	Ser	Gln
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<211> 490

<212> PRT

<213> Drosophila melanogaster

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 85 90 95
 Tyr Ser Gly Ile Val Val Ala Ser Gly Asp Gly Leu Phe Tyr Glu Val
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 Leu Asn Gly Leu Met Glu Arg Met Asp Trp Arg Arg Ala Cys Arg Glu
 115 120 125
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 130 135 140
 Ser Val Ala His His Cys Asn Glu Pro Tyr Glu Pro Lys Pro Ile Leu
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 His Ala Thr Leu Thr Cys Met Ala Gly Lys Ser Thr Pro Met Asp Val
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 Val Arg Val Glu Leu Ala Thr Arg Asp Lys His Phe Val Met Tyr Ser
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 Phe Leu Ser Val Gly Trp Gly Leu Ile Ala Asp Ile Asp Ile Glu Ser
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 Glu Arg Leu Arg Ser Ile Gly Ala Gln Arg Phe Thr Leu Trp Ala Ile
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 Leu Gly Lys Gly Lys Lys Glu Pro Pro Val Glu Ala Ala Arg Glu Leu
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 Pro Ala Glu Ser Thr Ala Ala Gly Ile Arg Ser Ser Leu Pro Leu Asn
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 Ala Gly Glu Phe His Asp Leu Pro Glu Glu Glu Gly Glu Ala Val
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 Leu Asp Gly Glu Gln Phe Ala Asp Ala Ile Ser Leu Asp Arg Ser Val
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 Ser Asp Gly Trp Ile Cys Glu Asp Gly Asp Phe Val Met Val His Ala
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 405 410 415

Ser Arg His Gln Leu Leu Asn Phe Met Leu Asn Leu Asn Ala Gly Thr
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 His Leu Pro Ile Gly Glu Asp Pro Phe Ile Lys Val Val Pro Cys Arg
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<211> 524

<212> PRT

<213> Drosophila melanogaster

<400> 20

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 35 40 45
 Leu Asn Pro Lys Ser Gly Ser Gly Asp Ala Arg Glu Val Phe Asn Met
 50 55 60
 His Val Thr Pro Val Leu Asn Glu Ala Glu Val Pro Tyr Asp Leu Tyr
 65 70 75 80
 Val Thr Lys His Ser Asn Phe Ala Ile Glu Phe Leu Ser Thr Arg Cys
 85 90 95
 Leu Asp Ala Trp Cys Cys Val Val Ala Val Gly Gly Asp Gly Leu Phe
 100 105 110
 His Glu Ile Val Asn Gly Leu Leu Gln Arg Gln Asp Trp Ala His Val
 115 120 125
 Leu Pro His Leu Ala Leu Gly Ile Ile Pro Cys Gly Ser Gly Asn Gly
 130 135 140
 Leu Ala Arg Ser Ile Ala His Cys Tyr Asn Lys Pro Val Leu Gly Ala
 145 150 155 160
 Ala Leu Thr Val Ile Ser Gly Arg Ser Ser Pro Met Asp Val Val Arg
 165 170 175
 Val Gln Leu Gln Ser Arg Ser Leu Tyr Ser Phe Leu Ser Ile Gly Trp
 180 185 190
 Gly Leu Ile Ser Asp Val Asp Ile Glu Ser Glu Arg Ile Arg Met Leu
 195 200 205
 Gly Tyr Gln Arg Phe Thr Val Trp Thr Leu Tyr Arg Leu Val Asn Leu
 210 215 220
 Arg Thr Tyr Asn Gly Arg Ile Ser Tyr Leu Leu Thr Asp His Glu Val
 225 230 235 240
 Ser Ser Thr His Ser Ala Thr Gly Tyr Ala Ala Gln Arg Arg Met Gln
 245 250 255
 Ser Ser Arg Ser Cys Asn Thr His Ile Asp Met Leu Asn Gly Pro Ala
 260 265 270
 Pro Ile Tyr His Ser Ser Ala Glu Tyr Leu Pro Gln Glu Phe Ala Asp
 275 280 285

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Val Ile Ser Leu Glu Thr Ser Ile Asn Gln Ser Phe Arg Ser Arg Cys
 290 295 300
 Asp Ser Trp Leu Ser Gly Gly Ser Arg Arg Ser Phe Tyr Tyr Ser Ile
 305 310 315 320
 Ser Glu Ser Ile Tyr His Ser Leu Ala Asp Glu Ser Glu Phe Ala Gly
 325 330 335
 Leu Ala Ala Ala Ser Leu Glu Asn Arg Gln Gln Asn Tyr Gly Pro Ala
 340 345 350
 Ser Glu Leu Pro Asp Leu Asn Glu Pro Leu Ser Glu Asp Gln Gly Trp
 355 360 365
 Leu Val Glu Glu Gly Glu Phe Val Met Met His Ala Val Tyr Gln Thr
 370 375 380
 His Leu Gly Ile Asp Cys His Phe Ala Pro Lys Ala Gln Leu Asn Asp
 385 390 395 400
 Gly Thr Ile Tyr Leu Ile Leu Ile Arg Ala Gly Ile Ser Arg Pro His
 405 410 415
 Leu Leu Ser Phe Leu Tyr Asn Met Ser Ser Gly Thr His Leu Pro Glu
 420 425 430
 Ser His Asp Asp His Val Lys Val Leu Pro Val Arg Ala Phe Arg Leu
 435 440 445
 Glu Pro Tyr Asp Asn His Gly Ile Ile Thr Val Asp Gly Glu Arg Val
 450 455 460
 Glu Phe Gly Pro Leu Gln Ala Glu Val Leu Pro Gly Ile Ala Arg Val
 465 470 475 480
 Met Val Pro Asn Val Ser Thr Phe Arg Phe Gln Ser Ala Thr Leu Gln
 485 490 495
 His Gly Ile Pro Val Cys Ile Pro Val Arg Lys Arg Phe Val Leu Tyr
 500 505 510
 Asn Met Ser Ser Glu Glu Leu Ala Pro Ile Asn Glu
 515 520

<210> 21
 <211> 368
 <212> PRT
 <213> Homo sapiens

<400> 21
 Val Leu Val Leu Leu Asn Pro Arg Gly Gly Lys Gly Lys Ala Leu Gln
 1 5 10 15
 Leu Phe Arg Ser His Val Gln Pro Leu Leu Ala Glu Ala Glu Ile Ser
 20 25 30
 Phe Thr Leu Met Leu Thr Glu Arg Arg Asn His Ala Arg Glu Leu Val
 35 40 45
 Arg Ser Glu Glu Leu Gly Arg Trp Asp Ala Leu Val Val Met Ser Gly
 50 55 60
 Asp Gly Leu Met His Glu Val Val Asn Gly Leu Met Glu Arg Pro Asp
 65 70 75 80
 Trp Glu Thr Ala Ile Gln Lys Pro Leu Cys Ser Leu Pro Ala Gly Ser
 85 90 95
 Gly Asn Ala Leu Ala Ala Ser Leu Asn His Tyr Ala Gly Tyr Glu Gln
 100 105 110
 Val Thr Asn Glu Asp Leu Leu Thr Asn Cys Thr Leu Leu Leu Cys Arg
 115 120 125

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Arg	Leu	Leu	Ser	Pro	Met	Asn	Leu	Leu	Ser	Leu	His	Thr	Ala	Ser	Gly
130						135					140				
Leu	Arg	Leu	Phe	Ser	Val	Leu	Ser	Leu	Ala	Trp	Gly	Phe	Ile	Ala	Asp
145					150					155					160
Val	Asp	Leu	Glu	Ser	Glu	Lys	Tyr	Arg	Arg	Leu	Gly	Glu	Met	Arg	Phe
				165					170					175	
Thr	Leu	Gly	Thr	Phe	Leu	Arg	Leu	Ala	Ala	Leu	Arg	Thr	Tyr	Arg	Gly
			180					185					190		
Arg	Leu	Ala	Tyr	Leu	Pro	Val	Gly	Arg	Val	Gly	Ser	Lys	Thr	Pro	Ala
	195						200					205			
Ser	Pro	Val	Val	Val	Gln	Gln	Gly	Pro	Val	Asp	Ala	His	Leu	Val	Pro
	210					215					220				
Leu	Glu	Glu	Pro	Val	Pro	Ser	His	Trp	Thr	Val	Val	Pro	Asp	Glu	Asp
225					230					235					240
Phe	Val	Leu	Val	Leu	Ala	Leu	Leu	His	Ser	His	Leu	Gly	Ser	Glu	Met
				245					250					255	
Phe	Ala	Ala	Pro	Met	Gly	Arg	Cys	Ala	Ala	Gly	Val	Met	His	Leu	Phe
			260					265					270		
Tyr	Val	Arg	Ala	Gly	Val	Ser	Arg	Ala	Met	Leu	Leu	Arg	Leu	Phe	Leu
	275						280					285			
Ala	Met	Glu	Lys	Gly	Arg	His	Met	Glu	Tyr	Glu	Cys	Pro	Tyr	Leu	Val
	290					295					300				
Tyr	Val	Pro	Val	Val	Ala	Phe	Arg	Leu	Glu	Pro	Lys	Asp	Gly	Lys	Gly
305					310					315					320
Val	Phe	Ala	Val	Asp	Gly	Glu	Leu	Met	Val	Ser	Glu	Ala	Val	Gln	Gly
				325					330					335	
Gln	Val	His	Pro	Asn	Tyr	Phe	Trp	Met	Val	Ser	Gly	Cys	Val	Glu	Pro
			340					345					350		
Pro	Pro	Ser	Trp	Lys	Pro	Gln	Gln	Met	Pro	Pro	Pro	Glu	Glu	Pro	Leu
		355					360					365			

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